

ABSTRACT OF THE DISCLOSURE

The present invention relates to a lead-free solder composition having a low coefficient of thermal expansion to reduce the likelihood of thermal shock to a glass substrate. The solder composition includes a granular material added to lead-free solder

5 where the granular material may include fused silica, zirconium oxide, Invar®, or any wettable, lead-free alloy such as 36% weight nickel or 64% weight iron and the solder may include tin, silver and bismuth. When a component is soldered to a glass substrate by the present invention and exposed to a substantial change in climatic temperature the granular material counteracts and adsorbs the stress caused by contraction of the solder,

10 thereby preventing thermal shock to the glass substrate.